



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------------|------------------|
| 10/731,747 | 12/09/2003 | Kazuhiro Tamura | ELPIDA 02USFP796 DIV | 4303 |
| 27667 | 7590 | 08/09/2005 | | |
| HAYES, SOLOWAY P.C. 130 W. CUSHING STREET TUCSON, AZ 85701 | | | EXAMINER THOMAS, TONIAE M | |
| | | | ART UNIT | PAPER NUMBER |

2822

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,747

Applicant(s)

TAMURA, KAZUHIRO

Examiner

Toniae M. Thomas

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-26 is/are pending in the application.
- 4a) Of the above claim(s) 18-20, 23, 24 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-17, 21, 22 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No: 10/260,484.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 July 2005 has been entered.

2. Currently, claims 14-26 are pending. Claims 18-20, 23, 24, and 26 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter applicant regards as his invention.

3. Claims 14-17, 21, 22, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The meaning of the phrase "substantially uniform" as recited in claims 14, 21, and 25 is unclear (claim 14, line 9; claim 21, line 11; claim 25, line 11). It is unclear how much thickness variation is encompassed by the phrase "substantially uniform." For purposes of examination, the phrase has been

Art Unit: 2822

broadly interpreted to allow for some variation in thickness along the entirety of the second portion.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. *Claims 14-17, 21, 22, 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al. (US 2002/0022340 A1).*

Regarding claims 14-17

The Lin et al. pre-grant published application (Lin) discloses a method for fabricating a semiconductor device (figs. 3A-3F and accompanying text). The method comprises the following steps as recited in claim 14: forming a trench 50 for isolation in a semiconductor substrate 100 (fig. 3B and par. 20)); and forming an insulating film 43 to cover the trench for relaxing an internal stress of the silicon substrate (fig. 3C and par. 21 and 25). The insulating film includes a first portion opposed to the bottom of the trench, and a second portion opposed to a side of the trench (fig. 3C), wherein a thickness of the first

Art Unit: 2822

portion of the insulating film is different from a thickness of the second portion of the insulating film, as recited in claim 14 (fig. 3F). The second thickness of the second portion is substantially uniform across the entirety of the second portion, as recited in claim 14.

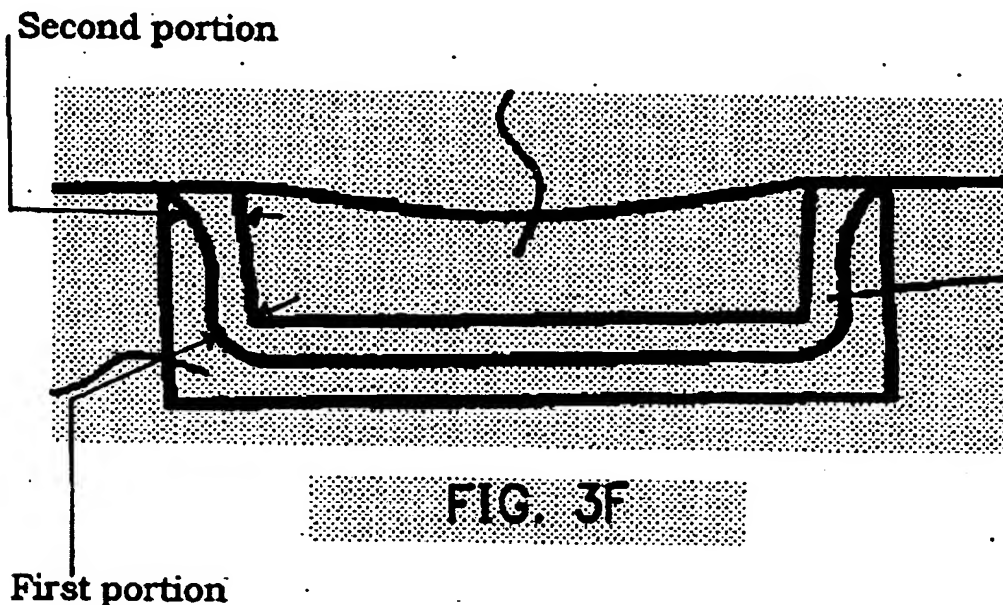


Figure 3F clearly shows that a thickness of the first portion of the insulating film 43 opposed to the bottom of the trench is thinner than a thickness of the second portion of the insulating film opposed to the sides of the trench, as recited in claim 15.

Another insulating film 42 is formed in the trench 50, such that the other insulating film exerts a compressive stress on the substrate, and the insulating film exerts a tensile stress on the substrate, as recited in claim 16 (fig. 3C and par. 21 and 25).

The insulating film 43 is formed of one selected from the group consisting of silicon oxide and silicon oxynitride, as recited in claim 17 (par. 21)

Regarding claims 21, 22, and 25

Lin discloses a method for fabricating a semiconductor device, the method comprising the following steps as recited in claims 21 and 25: forming a trench 50 for isolation in a semiconductor substrate 100 (fig. 3B and par. 20); forming a silicon oxide film 42 to cover the trench (fig. 3C and par. 21); and forming an insulating film 43 on the silicon oxide film, wherein the insulating film includes a first portion opposed to the bottom of the trench, and a second portion opposed to a side of the trench (fig. 3C and par. 21).

As discussed above with respect to claim 15, figure 3F clearly shows that a thickness of the first portion of the insulating film opposed to the bottom of the trench is thinner than a thickness of the second portion of the insulating film opposed to a side of the trench, as recited in claim 21. The second thickness of the second portion is substantially uniform across the entirety of the second portion, as recited in claim 21.

A thickness of the first portion of the insulating film is different from a thickness of the second portion of the insulating film, wherein the thickness of the second portion is substantially uniform across the entirety of the second portion, as recited in claim 25 (fig. 3F).

Art Unit: 2822

The insulating film 43 is formed of one selected from the group consisting of silicon oxide and silicon oxynitride, as recited in claim 22 (par. 21).

The insulating film is formed of one selected from the group consisting of silicon nitride and silicon oxynitride, as recited in claim 25 (par. 21, lines 3-6).

Response to Arguments

6. Applicant's arguments filed 22 July 2005 have been fully considered but they are not persuasive. The Applicant argues that:

Independent claims 14, 21, and 25, as amended, require "the second thickness of said second portion is substantially uniform across the entirety of said second portion." Lin et al. fails to teach this element. In Lin et al. the thickness of a second portion that is not substantially uniform across the entire second portion. In fact, the thickness dramatically varies over the length of the second portion in Lin et al.

The phrase "substantially uniform" allows for some variation in thickness across the entirety of the second portion. In addition, as noted in fig. 3 of Lin et al., the second portion has a uniform thickness except for the upper part. Hence, the second portion is deemed to have a substantially uniform thickness across its entirety.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT

04 August 2005



Mary Wilczewski
Primary Examiner